TECHNICAL SPECIFICATIONS

WASHINGTON STATE FERRIES

M.V. YAKIMA DRYDOCKING

CONTRACT NO. 00-7075

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TECHNICAL SPECIFICATIONS

For the following Technical Specifications, the Contractor is to provide all labor, material and equipment to accomplish each and every Bid Item unless otherwise specified.

The Specification Item sub-titles in brackets are for WSF internal use only, for Life Cycle Cost modeling. Bidders should ignore such bracketed sub-titles.

1. DRYDOCK VESSEL
{MAINTENANCE}

M.V. YAKIMA Vessel Particulars:
Length: 382'-2", **Beam**: 73'-2", **Draft**: 18'-6", **Gross Tons**: 2,704.

A. Drydock Vessel for cleaning, painting, inspections, the Work specified herein, and any necessary repairs.

B. Block spacing shall be at 12-foot centers. Within twenty-four (24) hours of Docking, provide three (3) copies of the block position drawing to the WSF Inspector indicating the block positions used.

C. Vessel shall be blocked to expose the previous docking block positions. **Attachment No. 3,** "Block Position Form" showing previous blocking position is provided.

2. TEMPORARY SERVICE

{MAINTENANCE}

A. Install one (1) telephone on board in a location designated by the Vessel Staff Chief Engineer. The telephone is to have one (1) outside line with toll-free access to Seattle and vicinity and, if different, one (1) line for local numbers. The telephone shall have touch-tone service if available from the Contractor's telephone system.

B. Provide and maintain electricity, water, safe lighted gangway and trash removal services while Vessel is in the contractor's facility.

C. Provide Safety and Security for the entire Vessel throughout this Contract period until such time as the WSF has accepted redelivery of the Vessel. Every reasonable precaution shall be taken to protect the Vessel from the hazards of fire, flooding, pilferage, malicious damage, and other events including cataclysmic phenomena of nature.

D. Provide and maintain comprehensive and effective fire prevention and fire detection, and fire fighting programs and systems sufficient to ensure the safety and integrity of the Vessel. Provide personnel trained in shipboard fire fighting techniques and also trained to cooperate with and assist local fire fighting organizations. Provide sufficient shore fire lines to ensure an adequate supply of fire fighting water, at sufficient pressure, and maintain an adequate number of tested fire-hoses aboard the Vessel to effectively fight fires at any location in the Vessel.

E. Provide and maintain portable fire extinguishers in sufficient quantity, and of the appropriate type, to combat local fires of any class. Provide sufficient fire watches, including roving watches as may be required, to ensure that fires that may be inadvertently started by welding sparks or heat, electrical malfunction, or spontaneous combustion are detected, reported and promptly extinguished.

3. SEA CHEST ANODES INSPECTION

{MAINTENANCE}

A. Open the four (4) anode covers located on top of the sea chests for inspection by the WSF Inspector and the Vessel Staff Engineer. (The covers weigh approximately 150 lbs. each and requires that two (2) electrical leads each be disconnected prior to anode removal and reconnected upon installation of the new anodes). Units are located ahead of the sea valves, two (2) per engine room. Protect deck from damage during this work Item.

B. Remove existing anodes and install new WSF supplied anodes. Close up access plates using new Contractor furnished gaskets, and grommets. The removed anodes will be placed on the vehicle deck and remain property of WSF.

C. Prior to installing the new anodes, prepare the access cover plates, including the surface where the anode covers mount, to an SSPC-SP3 Power Tool Cleaning, and apply two (2) coats of INTERNATIONAL Intertuf 262 series Epoxy, 5 mils (DFT) each coat, for a total of 10 mils (DFT).

4. RUDDER INSPECTION, NO. 1 AND NO. 2 ENDS
{MAINTENANCE}

A. Erect staging or provide suitable personnel lifting devices on both sides of No. 1 and No. 2 End Rudders to accomplish all affiliated work required and inspections.

B. Drain and conduct a satisfactory pressure test of the rudders for leaks in the presence of the WSF and USCG Inspector, and the Vessel Staff Engineer. Pressure test will consist of using forty-two inches (42") of water with Manometer or 1.5 PSI on acceptable calibrated pressure gauge that has 1.5 at mid scale range. Accepted test is no leaks for one (1) hour. Within twenty-four (24) hours of completion of tests, provide three (3) copies of the test results to the WSF Inspector.

C. Take and record rudder bearings clearances on No. 1 and No. 2 End Rudders within twenty-four (24) hours of drydocking the Vessel.

D. Open the Vehicle Deck cover plates on the upper Rudder Stock Bearing and take clearances. Close up cover with new countersunk stainless steel sockets head cap screws and new gaskets. Submit three (3) copies of a written report of findings to WSF Inspector within twenty-four (24) hours of taking readings.

5. PROPELLER INSPECTION, NO. 1 AND NO. 2 ENDS
{MAINTENANCE}

A. Erect, modify, and remove staging in area around No. 1 and No. 2 End Propellers as required to accomplish all affiliated work and inspections.

B. Remove the rope guards from the No. 1 and 2 Ends. Using the removed rope guards as templates fabricate new guards.

C. Polish the No. 1 and No. 2 End Propellers by power disk sanding using 80 grit or finer abrasive. Thoroughly clean propeller blades and hub for nondestructive testing.

D. Inspect No. 1 and No. 2 End Propellers for damage and proper blade track. Conduct a nondestructive test using a qualified NDT Inspector, for surface cracks on the blades in the presence of the WSF and USCG Inspectors, and the Vessel Staff Chief Engineer. Submit three (3) copies of a written report of findings to the WSF Inspector within twenty-four (24) hours of test completion.

6. EAGLE SEAL WEARDOWN READINGS, NO. 1 AND NO. 2 ENDS

{MAINTENANCE}

A. Drain all oil from the outer Eagle Seal System. Dispose of oil.

B. Take Eagle Seal bearing wear down readings in the presence of the WSF Inspector and the Vessel Staff Chief Engineer. Submit three (3) copies of the written reports of the readings to the WSF Inspector. Upon completion of taking wear down readings, lock wire the liner and housing fasteners. Fill the outer seal with Hyperlube or STP.

C. Prior to installing the rope guards remove the existing zincs and replace them with new.

7. VOID TANK INSPECTION

{MAINTENANCE}

A. Provide the services of a Marine Chemist to certify voids "SAFE FOR WORKERS TO ENTER". The Vessel's crew will open the 32 manholes. Vessel's crew will close up the manholes using new, Contractor furnished, cotton grommets and gaskets.

PAINTING OF VESSEL AND HULL PRESERVATION

Special Note

(ATTACHMENT NO. 1)

Area Preparation, Surface Preparation, Grit Blasting, Paint Coatings, and Inspection for Vessel's hull, curtain plates, casing and super structure shall be in accordance with Washington State Ferries Marine Coating Specification 01/03 unless otherwise specified in the following Specifications.

8. FRESH WATER WASH
{MAINTENANCE}

A. Within twenty-four (24) hours upon Drydocking Vessel, perform a Low-Pressure Water Cleaning (LP WC) at 3,000 - 3,500 PSI in accordance with SSPC-SP 12/NACE 5. The wand shall be held no more than twelve inches (12") from surface being washed. The entire hull from the guard to the keel, including all horizontal and vertical surfaces of the guard, flat keel, rudders, sea chests and strainer plates, propellers and all other exterior components of the Vessel that is part of the vessel below the guard shall be washed. The wash shall leave no visible growth or residue after the hull dries from washing.

B. Remove sea chest strainer plates prior to pressure wash. Prior to closing sea chests they shall be inspected by the WSF Inspector and the Staff Chief Engineer. Reinstall strainer plates upon completion of all related work using new cotter keys.

9. PREPARATION OF VESSEL HULL FOR SURFACE PREPARATION
{MAINTENANCE}

NOTE:

Care shall be taken to avoid damage to the "Capac" anodes and reference cells. The anodes are located at frame 54 Port and Starboard, both Ends, nine feet (9') above the keel. The reference cells are located on the Starboard side toward the No. 1 End and Port side toward the No. 2 End.

A. Install protective covering on propellers, propeller bearings, rudder bearings, exposed shafting, CAPAC anodes and reference cell, all through-hull penetration and entrance ways to protect and prevent surface preparation material from causing damage or entering Vessel. Blank the main sea suction openings from the inside while the valves are removed for maintenance, so the valve mounting flange may be painted on the inside diameter.

B. Conduct an inspection with the WSF Inspector and the Vessel Staff Chief Engineer prior to beginning surface preparation.

10. SURFACE PREPARATION OF HULL
{MAINTENANCE}

NOTE:

The Contractor shall have the option to grit blast to an SSPC-SP6, Commercial Blast Cleaning or Hydroblast to Hydroblast Standard, HB 2½ L, Light Flash Rusting.

The intent is to spot coat repair the existing coating. For bidding purposes assume **5,000 Square Feet of hull,** will require preparation (3000 SF below the waterline and 2000 SF above). Surface profile will be 2 to 4 mils per **Attachment No. 1**. Upon the completion of preparation and painting the hull, the contract will be adjusted upwards or downwards to account for the actual area authorized by the WSF Inspector.

A. Prepare areas of abrasion and corrosion on the hull from the top of the guard to the keel, including flat keel, sea chests, strainer plates and rudders, to an SSPC-SP6, Commercial Blast Cleaning or an Hydroblasting standard HB 2½ L, Light Flash Rusting.

B. The ANTI-FOULING coating, for at least two inches (2") bordering the blasted area, shall be removed to existing ANTI-CORROSIVE coating and feathered to a smooth surface.

11. PAINTING OF VESSEL HULL, ANTI-CORROSION COATING
{MAINTENANCE}

NOTE:

For bidding purposes assume that **5,000 square feet** of the hull will require the ANTI-CORROSION COATING. The contract will be adjusted upward or downward using the square footage determined in SURFACE PREPARATION OF HULL Item.

A. Apply one (1) coat of INTERNATIONAL Intertuf 262 Series epoxy, Red, to a minimum of 5 mils (DFT) to surface areas prepared in the, SURFACE PREPARATION OF HULL Item**.**

B. Apply one (1) coat of INTERNATIONAL Intertuf 367, Buff, to a minimum of 5 mils (DFT) of contrasting color to all surfaces painted in paragraph "A" of this Work Item.

12. PAINTING OF VESSEL HULL, BELOW WATERLINE ANTI-FOULING (SPOT COAT)

{MAINTENANCE}

NOTE:

For purpose of bidding assume that **3,000 square feet** of the hull will require the FIRST coat of ANTI-FOULING coating. The contract will be adjusted upward or downward using the square footage determined in SURFACE PREPARATION OF HULL Item.

A. Apply one (1) coat of INTERNATIONAL Interspeed Anit-fouling, BRA 640 RED, to a minimum of 4 mils DFT to all surfaces painted below the waterline in the Painting of Vessel Hull, Anti-Corrosion Coating Item.

13. PAINTING OF VESSEL HULL, BELOW WATERLINE ANTI-FOULING (FULL COAT)

{MAINTENANCE}

A. Apply one (1) full coat of INTERNATIONAL Interspeed Antifouling 642, black, to a minimum of 6 mils (DFT) to all surfaces of hull below the waterline.

14. DRAFT AND HULL MARKINGS

{MAINTENANCE}

A. Repaint all draft marks and underwater hull markings, using INTERNATIONAL Interlux Y5584, Shark White**.**

15. PAINTING OF VESSEL HULL, ABOVE THE WATERLINE

{MAINTENANCE}

NOTE:

For purpose of bidding assume that **2,000 Square feet** of hull above the waterline will require painting with WSF Green. The contract will be adjusted upward or downward using the square footage determined in SURFACE PREPARATION OF HULL Item.

A. Apply one (1) coat of INTERNATIONAL Intercare 755, WSF Green, to a minimum of 2 mils (DFT) to all surfaces prepared above water line in Painting Of Vessel Hull, Anti-Corrosion Coating Item.

16. PAINTING OF THE VESSEL GUARD
{MAINTENANCE}

A. Apply one (1) coat of INTERNATIONAL Intertuf 262, Black, to a minimum of 5 mils (DFT).

17. CAPASTIC REPAIRS
{MAINTENANCE}

A. Renew capastic around the CAPAC anodes using 'Capastic' epoxy trowelng compound made by ELECTROCATALYTIC, INC. For bidding purposes, assume 25 square feet of failed capastic will require repair. The capastic shall be applied to a minimum thickness of 1/8 inch in the area of the shield out from the faired area around the anode.

B. Build up a minimum of 22 mils DFT of epoxy Anti-Corrosion coating over the capastic areas and the secondary dielectric shield areas.

18. APPLICATION OF DURAFLAKE
{MAINTENANCE}

NOTE:

For bidding purposes, assume **60 Square Feet** for each of the No. 1 and No. 2 Ends, for a **total of 120 Square Feet**. Contract will be adjusted upward or downward to account for the actual area authorized by the WSF Inspector.

A. Grit blast the Rudders, Rudder Shoes, and Stern Tube Bosses, (in the areas designated by the WSF Inspector), to an SSPC-SP 5 **White metal blast,** with a profile of 4 to 6 mils, (required for Duraflake applications). **(60 square feet** each end for a total of **120 square feet).**

B. Apply a coating of Marine Grade Duraflake to the areas prepared in paragraph A of this Item. Coating shall be applied to a minimum of 30 mils. Supervision of the Duraflake installation shall be obtained from Corrosion Specialists Incorporated. The contact is Mr. Brad Bradshaw, (360) 568-2098.

C. Grind the entire surface of the Duraflake smooth to prevent cavitation. No rough edges will be allowed.

D. Apply underwater paint coating system as described in Painting of VESSEL HULL, BELOW WATERLINE, ANTI-FOULING (FULL COAT) Item.

19. SEA VALVE INSPECTION
{MAINTENANCE}

A. Open the below listed sea valves, clean and blue as required for inspection. All valves two inches (2") and below shall be replaced in kind, with new contractor supplied valves and hydrostatically tested prior to installation to the satisfaction of the WSF and USCG Inspector. Removed valves shall remain the Vessel's property.

SEA VALVE LIST

QTY	SERVICE	SIZE	TYPE
4	**Main sea valves**	**10"**	**gate**
4	**Main engine cooler overboard**	**5"**	**gate**
4	**Main Engine checks in voids**	**5"**	**check**
2	**Ship service generator overboard**	**3"**	**gate**
2	**Check valves in voids**	**3"**	**check**
1	**No. 3 SSD generator overboard**	**2''**	**check**
1	**No. 3 SSD generator overboard**	**2''**	**globe**
2	**Fire pump overboard discharges**	**4"**	**gate**
1	**Engine Room Bilge Pump overbd.**	**4"**	**gate**
1	**Check valve in void**	**2"**	**check**
2	**Fire pump Overboards in void**	**4"**	**check**
4	**Sea chest vents**	**1 ½"**	**gate**
2	**Fire pump emergency bilge suction**	**6"**	**globe**
1	**Fire pump independent bilge suction**	**5"**	**angle globe**
4	**Seachest Vent**	**¾"**	**globe**

B. Sea valves shall be inspected by the WSF and USCG Inspectors looking at the general material condition, valve seat contact and proper mechanical operation.

C. After inspection, reassemble/install the valves using new stem packing and new gaskets on all valve flange connections and valve bonnets.

20. AUDIO GAUGE TREATMENT TANKS
{MAINTENANCE}

A. Perform an ultrasonic survey of the Vessel's steel plating thickness on the. Two (2) saltwater treatment tanks. The survey shall be done on all sides and the top on a 6" grid pattern. The survey shall be performed in the presence of the WSF Inspector. Estimate 150 shots will be required. The tanks are located one (1) in each engine room.

B. The readings shall be taken from the exterior of the tank. The exact areas to be surveyed will be designated by the WSF Inspector. The readings shall be taken through the paint in areas of smooth surface. Remove and restore the paint as required to obtain the readings.

C. Provide the WSF Inspector with three (3) copies of the report in a tabular form, identifying the locations of readings by location, original plate thickness, audio gauge reading taken, and percent wastage. Attach a schematic showing the locations where the shots were taken and the thickness found.

D. Repair any coating damage as required.

21. CELL PHONE REPLACEMENT
{IT}

A. Install the cellular phone system as shown on WSF Dwg. 8201-642-095-02, M/V HYAK CELLULAR PHONE INSTALLATION.

B. Carefully map all interferences to be removed including insulation and ceiling panels.

C. Remove the existing cellular system. Shift the LAN cabinet from the No. 2 pilothouse void to allow access for filter change outs on the ventilation system.

D. Fabricate and install new antenna foundations in locations designated by the WSF Inspector.

E. Mount the equipment in the new cabinet as shown. WSF will provide a electronics contractor to make final connections and test system operation.

F. Prepare all surfaces affected by this work to an SSPC-SP3, Power Tool Cleaning. Coat with one (1) coat of INTERNATIONAL Intertuf 262 Epoxy, 5 mils (DFT); apply a topcoat of INTERNATIONAL Intercare to a minimum of 2 mils (DFT) to match existing color. Restore all removed interferences.

22. WALK OFF MAT INSTALLATION
{MAINTENANCE}

A. Install a 6’ by 8’ walk off mat at each exit door from the main cabin to the pickleforks, four (4) total. Mats shall be Bonar Floors Inc, Coral Duo-Graphite 9110.

B. Remove existing tile and underlayment. Prepare disturbed areas in way of the mat installation to an SSPC-SP 3, power tool cleaning.

C. Coat with one (1) coat of INTERNATIONAL Intertuf 262 Epoxy, 5 mils (DFT).

D. Install underlayment and structural fire protection so that the walkoff mat to be flush with the floor tiles. Coat the underlayment with an epoxy sealer prior to installing the walkoff mats. Coral Duo shall be laid with the ribs running at right angles to the walking direction.

E. Install a stainless steel transition strip with removable flat top and countersunk fastners over the transition between deck tile and mat.

23. PREP AND PAINTING UPPER PASSENGER DECK {MAINTENANCE}

A. Perform a Low Pressure Water Cleaning (LP WC) at 3,000 - 5,000 PSI to achieve a condition of SC-1 IAW Table 2 (Non-visual Surface Preparation Definitions) in SSPC-SP 12/NACE 5 Publication, on the Upper Passenger Deck. The wand shall be held no more that twelve inches (12") from surface being washed. Perform an inspection of the entire fresh water washed areas to the satisfaction of the WSF Inspector prior to proceeding with any preparation for painting, or painting

B. Prepare the entire area of the Upper Passenger Deck excluding the solariums, to SSPC-SP6, Commercial Blast Cleaning with a track blaster to obtain a 2 to 3 mil profile. Remove all traces of blast beads from all areas of the Vessel. Areas that are inaccessible to a track blaster shall be prepared to SSPC-SP3, Power Tool Cleaning.

C. Apply one (1) anticorrosive coat, Sherwin-Williams Corothane 1 Galva-Pac Zinc, gray, to obtain 3 to 4 mils (DFT) to all surfaces prepared under above. Apply one (1) primer coat, American Safety MS 7CZLT, gray, to obtain 4 to 5 mils (DFT) to all surfaces prepared under above. Provide a six inch (6") margin in way of the water way bar and around all deck structures. Apply one (1) coat of Haze Gray to this combing area. Apply one (1) Non-Skid coat, American Safety AS-250, Haze Gray to all other surfaces prepared under the above paragraph.

24. PREP AND PAINT CURTAIN PLATE {MAINTENANCE}

A. Perform a Low Pressure Water Cleaning (LP WC) at 3,000 - 5,000 PSI to achieve a condition of SC-1 IAW Table 2 (Non-visual Surface Preparation Definitions) in SSPC-SP 12/NACE 5 Publication, in Zones 3. The wand shall be held no more that twelve inches (12") from surface being washed. Use Ameron, Prep 88 or International GMA or equal when washing.

B. Perform an inspection of the entire fresh water washed areas to the satisfaction of the WSF Inspector prior to proceeding with any preparation for painting, or painting.

C. Prepare areas of abrasion and corrosion. For bidding purposes assume 1,000 square feet will require preparation.

NOTE:

The Contractor shall have the option to grit blast to an SSPC-SP6, Commercial Blast Cleaning or Hydroblast to Hydroblast Standard, HB 2½ L, Light Flash Rusting.

D. Areas prepared in paragraph C of this Item will be coated with two (2) coats of INTERNATIONAL Intertuf 262 series Epoxy, 5 mils (DFT) each coat, for a total of 10 mils (DFT). Hand-stripe all edges.

E. Apply a topcoat of INTERNATIONAL Intercare 755 series at a minimum of 2 mils (DFT) to the green strip. The remaining area shall be a topcoat of INTERNATIONAL Intercare 755 series at a minimum of 2 mils (DFT) to match the existing coatings.

GENERAL CONSTRUCTION REQUIREMENTS

(ATTACHMENT NO. 2)

SUPPLEMENTAL SPECIFICATION

Details of all piping, structural and electrical installations shall be in accordance with Attachment No. 2, General Construction Requirements, unless otherwise specified in the following Specifications.

25. SHIP SERVICE DIESEL GENERATOR PIPING MODIFICATIONS {MAINTENANCE}

A. Disconnect and remove the existing No. 1, No. 2 and No. 3 Ship Service Diesel Generator salt water cooling pumps and piping as shown on M.V. KALEETAN, Generator Replacement Machy ARR & Piping Mods, WSF Dwg. No. 8202-627-074-01.

NOTE:

All welding qualifications, procedures, and certifications shall meet the requirements for welding as set forth in **Attachment 2** of this Specification.

B. Clean the entire bilge areas of both Engine Rooms, and maintain cleanliness during the course of the Work.

C. Install new Contractor Furnished saltwater pumps and piping as shown on WSF Dwg. No. 8202-627-074-01. Reuse the existing wiring and controllers.

D. Testing of the diesel-alternator sets shall demonstrate, at a minimum, the following:

1. Satisfactory operation of the unit with the alternator at its rated RPM.

2. Proper operation of the start and stop controls both at the unit and at the remote stations.

3. Proper operation of speed control both at the unit and at the remote stations.

4. Normal operation of all meters, gages, and alarms.

5. Proper temperatures and pressure are maintained during the test.

E. Verify that all installed systems operate as intended. This includes all system components, all safety devices, and all alarms, monitoring, and control devices. WSF will provide an engine crew in support of generator testing and check out during load tests and dock trials.

F. Provide assistance to DETROIT DIESEL Technical Representatives to assist with system testing.

NOTE:

For bidding purposes assume twenty (20) hours will be required. This Item will be adjusted upwards or downwards to account for the actual labor hours required by the DETROIT DIESEL Technical Representatives.

G. Prepare all areas of new installation and damaged paint affected by this Item, to SSPC-SP 3, Power Tool Cleaning. Provide labor, material and equipment to coat all prepared surfaces with INTERNATIONAL, Intertuf 262 a minimum of 6 mils (DFT). Hand stripe all edges using INTERNATIONAL, Intertuf 262 a minimum of 5 mils (DFT). Apply a minimum of 2 mils, to (DFT), to cover, INTERNATIONAL, Intercare 755 finish coat to match surrounding color.

(END)